CLAIMS:

1. An ultrasonic transmitting and receiving apparatus comprising:

an ultrasonic transducer array including plural ultrasonic transducers for transmitting ultrasonic waves and receiving ultrasonic waves reflected from an object to be inspected;

drive signal generating means for generating drive signals for respectively driving said plural ultrasonic transducers;

transmission control means for controlling said drive signal generating means such that ultrasonic waves to be transmitted from said plural ultrasonic transducers form a transmission beam to be transmitted in at least one direction;

reception control means for performing reception focusing processing on plural detection signals obtained based on ultrasonic waves received by said plural ultrasonic transducers so as to form a reception focal point in at least one direction thereby forming a reception beam; and

control means for changing directivity of plural ultrasonic components constituting the transmission beam in accordance with a sound ray direction in which the transmission beam is transmitted and/or changing directivity of plural ultrasonic components constituting the reception beam in accordance with a sound ray direction in which the reception focal point of the receiving beam is formed.

2. An ultrasonic transmitting and receiving apparatus

according to claim 1, wherein said control means makes the directivity of said ultrasonic components stronger as an angle formed by a front direction of said ultrasonic transducer array and said sound ray direction becomes smaller.

3. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said control means changes the directivity of said ultrasonic components by changing a number of ultrasonic transducers to be used simultaneously when forming said ultrasonic components.

4. An ultrasonic transmitting and receiving apparatus according to claim 2, wherein said control means changes the directivity of said ultrasonic components by changing a number of ultrasonic transducers to be used simultaneously when forming said ultrasonic components.

5. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said control means performs weighting on the plural drive signals to be used when forming said ultrasonic components.

6. An ultrasonic transmitting and receiving apparatus according to claim 2, wherein said control means performs weighting on the plural drive signals to be used when forming said ultrasonic components.

7. An ultrasonic transmitting and receiving apparatus according to claim 3, wherein said control means performs weighting on the plural drive signals to be used when forming said ultrasonic components.

8. An ultrasonic transmitting and receiving apparatus

according to claim 4, wherein said control means performs weighting on the plural drive signals to be used when forming said ultrasonic components.

9. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said reception control means performs reception focusing processing on said at least one direction in which the transmission beam is transmitted so as to form reception focal points in plural directions.

10. An ultrasonic transmitting and receiving apparatus according to claim 2, wherein said reception control means performs reception focusing processing on said at least one direction in which the transmission beam is transmitted so as to form reception focal points in plural directions.

11. An ultrasonic transmitting and receiving apparatus according to claim 3, wherein said reception control means performs reception focusing processing on said at least one direction in which the transmission beam is transmitted so as to form reception focal points in plural directions.

12. An ultrasonic transmitting and receiving apparatus according to claim 4, wherein said reception control means performs reception focusing processing on said at least one direction in which the transmission beam is transmitted so as to form reception focal points in plural directions.

13. An ultrasonic transmitting and receiving apparatus according to claim 5, wherein said reception control means performs reception focusing processing on said at least one direction in which the transmission beam is transmitted so

as to form reception focal points in plural directions.

14. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said reception control means performs reception focusing processing on plural directions in which the transmission beams are transmitted so as to form reception focal points in the plural directions, respectively.

15. An ultrasonic transmitting and receiving apparatus according to claim 2, wherein said reception control means performs reception focusing processing on plural directions in which the transmission beams are transmitted so as to form reception focal points in the plural directions, respectively.

16. An ultrasonic transmitting and receiving apparatus according to claim 3, wherein said reception control means performs reception focusing processing on plural directions in which the transmission beams are transmitted so as to form reception focal points in the plural directions, respectively.

17. An ultrasonic transmitting and receiving apparatus according to claim 4, wherein said reception control means performs reception focusing processing on plural directions in which the transmission beams are transmitted so as to form reception focal points in the plural directions, respectively.

18. An ultrasonic transmitting and receiving apparatus according to claim 5, wherein said reception control means

performs reception focusing processing on plural directions in which the transmission beams are transmitted so as to form reception focal points in the plural directions, respectively.